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ABSTRACT

This issue of "Science Education News" is concerned with nontraditional approaches to college-level education. Recent trends and new programs representing examples of innovative learning are presented by these six articles: The Prospects for Nontraditional Study; Accreditation of Nontraditional Study Programs; New York Regents External Degree; The British Open University; Minnesota Metropolitan State College; and The University Without Walls. As a supplement to the descriptions of 13 science teaching societies contained in the December, 1971 issue (SE 013 143), the current issue reports on two additional organizations: National Council for Geographic Education and Associated Organization for Teacher Education. An annotated list of recent publications with six entries is included. (PR)

American Association for the Advancement of Science

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April 1972

Nontraditional Learning

The Prospects for Nontraditional Study

In setting the stage for the articles and reports to follow in this issue let me reflect the early discoveries of the Commission on Non-Traditional Study, now beginning its second and final year of life. The Commission is not yet ready to make recommendations, but we have noted a number of significant developments that are worth summarizing. These may serve as starting points and reasons for the initiatives that we think will become more and more apparent throughout the higher education world in the immediate months and years to come.

We find enormous interest and considerable activity in nontraditional education already evident throughout the country. Most recently the external degree has been receiving the lion's share of attention, but other nontraditional approaches are also being attempted more widely than we had supposed to be the case. There is a great emotional surge, among educators and the lay public alike, toward a postsecondary educational system with more flexibility than heretofore and with more options from which the individual should be able to choose, regardless of age or circumstances. The reasons for such interest vary but there is no question that it exists. Educators have their major concern centered in desirable academic change; public officials seem to be thinking about economies, which may not be possible.

We find that there is great difficulty in defining in a truly precise way what nontraditional education actually is. The term is so general and so all-encompassing as to defy accurate definition. The suggestion has even been made that by defining traditional education clearly one might then consider all that is left to be nontraditional. The elements of change, relevance, flexibility or adaptability to individual need, increased options, use of modern technology, location—these are all pertinent to the development of nontraditional study, however. Perhaps such elements are sufficient as a guide until a more carefully constructed definition emerges.

We find that nontraditional study will continue to develop and grow in this country whether or not it is carefully planned with appropriate evaluations and safeguards to quality. Some of this development and growth is being stimulated from sources independent of our traditional institutions of learning. This is reaching such proportions that a parallel and unrelated system of postsecondary education may ultimately come into being. The parallelism may be desirable or it may be dangerous; the unrelatedness will certainly pose great dangers and difficulties. There are extremists on both sides here: the rigid traditionalists who are holding fast to their time-honored concepts of how education should be offered as well as what should be offered, and the revolutionary reformers who wish to sweep away all that has gone before and start afresh.

We find that some existing institutions are rushing into these new forms of education with public commitments unsupported by detailed plans, whether of organization or programs. This is raising unrealistic expectations on the part of prospective students, which may ultimately lead to disillusionment and bitterness. Announcements of early and swift intentions have been made with little or no evidence to indicate that more than a worthy desire exists, and with no fleshing out, as yet, of how these intentions are to be implemented in sound educational ways. We find also that charlatans in our midst are taking advantage of the flexibility of nontraditional education to increase their "diploma-mill" types of operation.

We find that a great body of mythology or folklore about nontraditional study is emerging, not based as yet in fact because of insufficient data. Some is positive, some negative. This new form of education is sometimes championed as the answer to all of education's problems, academic, economic, even psychological; it is just as often condemned for pointing the way to a dangerous dilution of academic quality. It is feared by some private colleges as a threat to their survival; it is feared by faculty as a way by which many of them will be replaced; it is feared by some public institutions of learning as a way by which their operating and capital budgets will be trimmed. As yet, however, there is insufficient evidence to support any of these views.

We find that considerable interest exists among traditional, college-age students in participating somehow

in aspects of nontraditional study. Their general dissatisfaction with the status quo and their current unrest is leading them to search for more options in their educational pursuits, whether in nonresidential study, independent study, work and study, or others. This is not a majority of students but it is a sizable minority. More needs to be known about this group and its aspirations or motivations before we can draw any valid conclusions.

We find a general lack of communication and a consequent duplication of effort among those individuals, agencies, or institutions engaged in or planning for nontraditional education. Furthermore, opportunities for study that presently exist for the individual are not easily identifiable, nor are there enough systematic ways to communicate such information to him. The mail we have received from all parts of the country and the many interviews we have had convince us that a large number of diverse efforts are currently under way. Yet there is little general knowledge of these and no data on their effectiveness. Everyone seems to be going his own way without regard for what anyone else is doing. Perhaps this is part of the nontraditional spirit, but if so, it may ultimately be a very confusing and wasteful part.

We find that there has been insufficient evaluation of different types of experience that might warrant academic credit in a nontraditional setting. There has been a similar lack of evaluation of the benefits or negative effects of interrupted study. These are two important components about which much more needs to be known.

Finally, we find that the whole area of subject matter for nontraditional study is largely unexplored as yet, at least in the construction of new curricula or modules of courses within these curricula. Whether nontraditional approaches materially affect the subject matter to be offered is open to question. There is a need to examine this point carefully, however, since it lies at the heart of any educational effort. As of now, this has not been done in more than cursory fashion.

These findings, though preliminary, reflect how much remains to be known and done as we consider the necessities for change in our educational structure and environment together with the possibilities they may bring forth. It is an exciting prospect, touched with some dangers but touched even more with the promise of new achievements.—SAMUEL B. GOULD, *Chairman, Commission on Non-Traditional Study, 888 Seventh Avenue, New York, New York 10019.* The Commission was established by the College Entrance Examination Board and Educational Testing Service.

Accreditation of Nontraditional Study Programs

The growing public interest in nontraditional educational programs at the higher education level has caused a great many established institutions to review their own position in fulfilling their stated objectives in relation to a demand for public and community service by their constituents. The position of regional accreditation on nontraditional study programs also has been reviewed, and attempts are under way to make standards more relevant to current educational innovations in response to public needs.

Nearly three years ago at the summer meeting of the Executive Council of the Commission on Colleges of the Southern Association of Colleges and Schools a study was authorized to determine the status and interest of the 561 member institutions of the Commission in nontraditional study programs. The study, which took two years to complete, was based on a 55-page survey instrument which was completed and returned by 502 institutions. An analysis of the responses revealed extensive activity and interest in nine definable program areas. These areas include external- or special-degree programs, off-campus classes and units, independent study programs (including correspondence and home study), conferences and institutes including short courses and workshops, foreign travel study, media instruction, and special on-campus programs including evening programs.

As a result of the study, an extensive revision of the existing standards was made in order to provide guidelines for member institutions that have developed, or wish to develop, nontraditional study programs. The new standard was presented to the delegates of the member institutions at the annual meeting of the college delegate assembly meeting in Miami Beach, December 1, 1971 and was adopted by unanimous vote.

This action by the Southern Association to incorporate specific guidelines into accrediting standards gives formal recognition by a regional accrediting agency to off-campus degree programs and other nontraditional studies. Generally, the new standard "seeks to encourage motivation and an imaginative approach" by the institution for providing "quality instruction" to its various constituents. Specifically, the standard provides a set of illustrations or guidelines by which an institution may develop its program. These guidelines provide for (1) administration and organization, (2) finance, (3) faculty, (4) students, (5) operationally separate units (degree granting), (6) external- or special-degree programs (nontraditional study), (7) off-campus classes and units, (8) independent study, (9) conferences and institutes, (10) media instruction, (11) foreign travel and study, and (12) special on-campus programs.

The illustrations for accreditation are broad based and are largely administrative in nature, which enables them to be applicable to any discipline or professional field within any institution.

Also included in the standard is a new uniform measure for noncredit courses and programs. The continuing education unit (c.e.u.) which is defined as "10 contact hours of participation in an organized continuing education (adult or extension) experience under responsible sponsorship, capable direction, and qualified

instruction" was adopted as the unit of measure. The c.e.u. is the product of a national task force of educators under the direction of William L. Turner, formerly dean of university extension at North Carolina State University at Raleigh, now director of administration of state government in North Carolina. By including the c.e. unit in the new standard the College Commission is requiring the member institutions to use the unit as a record-keeping measure for all noncredit activities of an individual and the institution. A handbook on the full use of the c.e. unit, including evaluation of a student's noncredit work and faculty participation in noncredit work, is being developed by the task force and the Southern Association and should be in print by fall of 1972.

Gordon W. Sweet, executive secretary of the College Commission, sees the standard for nontraditional study programs as an example of a new effort on the part of the regional accrediting agencies to "get ahead of the new developments in the field of higher education" and to offer "positive encouragement and guidelines to institutions that want to respond to constituent needs for public service and professional development programs."

While the new standard provides a way for institutions to develop most types of nontraditional study programs, it also provides for quality control within each of the program areas by outlining proper administrative procedures and organization, a sound financial base, adequate facilities, and a qualified faculty. The number of credits or c.e. units to be granted for a course or program is appropriately protected. The standard also specifies that all nontraditional programs "must be compatible with the educational program and objective of the total institution" and that all such programs will be a part of the total evaluation of an institution for accreditation.

The current decade will see a great expansion on the part of traditional educational institutions into nontraditional study areas. The public demand for such programs need not prove a threat to the existing institutions. New institutions specifically designed for nontraditional study programs *will* be created, but *need not be created* to provide these programs if the existing institutions will respond to the educational needs of individuals and groups in a changing society by developing new and different ways of learning. At least in this instance, in the South a vehicle has been created by which the established institution can legitimate nontraditional study as a program consonant with regular academic programs.—GROVER J. ANDREWS, *Assistant to the Director, Southern Association of Colleges and Schools, and director of the Study for the Revision of Standard Nine, Special Activities (Nontraditional Studies).*

New York Regents External Degree

In 1971 the Carnegie Corporation and the Ford Foundation decided to support an external-degree program to be based in large part on examinations and to be awarded by the New York State Board of Regents. The two conditions that led foundation officials and the regents to think an external-degree program could be developed were: New York's unique educational system under the regents and a highly successful credit-by-examination experience with their College Proficiency Examinations.

The University of the State of New York is the oldest state educational agency in the United States. Presided over by the board of regents and administered by the commissioner of education who serves as president of the university, it includes all public and private colleges and universities, elementary and secondary schools, libraries, museums, historical societies, and other educational agencies in the state. The entire state is its campus; all who engage in the educational process its faculty and students.

The regents and the commissioner are authorized to determine the state's educational policies, charter private colleges, approve and supervise academic programs leading to degrees, license and discipline most professions except law, and confer degrees.

About ten years ago the regents decided to establish the College Proficiency Examination Program in order to permit individuals to obtain college credit or other educational advantages with or without formal classroom attendance. Since 1963 over 17,000 tests have been given in some 30 different subjects. In the past two years nearly 13,000 proficiency examinations have been administered, mostly in the nursing sciences, foreign languages, health education, and teacher education. Increased interest has also been evident in the humanities and social sciences.

It was against this background that Ewald B. Nyquist, commissioner of education and president of the university, announced his Regents External Degree idea in 1970.

In preparation at this time are programs leading to a baccalaureate degree in business and an associate in arts degree. Because of our encouraging experience with credit-by-examination in nursing—11,000 credits in three years—we have also decided to develop an external associate in applied science in nursing degree. Faculty and administrators from New York colleges and universities, along with leaders from business and industry, are working with State Education Department staff to determine requirements and appropriate assessment techniques for evaluating the knowledge and abilities needed to obtain a regents external degree.

In the regents external associate in arts degree, available now, we have a fairly traditional curriculum combined with highly nontraditional means of meeting the requirements. Degree candidates must demonstrate knowledge of the humanities, social sciences, and natural sciences or mathematics but may choose to do so by passing College Proficiency Examinations (CPE's) or national tests, like the College Level Examination Program (CLEP) or Advanced Placement (AP) tests; by having their experience evaluated by faculty panels;

or by submitting transcripts from colleges and universities or from the United States Armed Forces Institute (USAFI). There will be no specific course or subject requirements within the general education categories.

To be offered in 1973, the bachelor of science in business administration degree will consist of professional and general education requirements. Candidates must demonstrate basic competence in accounting, finance, management of human resources, marketing, and operations management by passing examinations, and they must specialize in one of these fields. Since there are no prerequisites for these tests, candidates with considerable previous experience will be encouraged to begin at more advanced levels. CPE's, CLEP, USAFI, and regular college study are among many acceptable ways of meeting the general education requirement.

Although program and test development has just begun, requirements for the Associate in Applied Science in Nursing degree are likely to include the cognitive and clinical aspects of the nursing sciences and general education. The widely accepted College Proficiency Examinations in the nursing sciences will be administered to students graduating from representative two- and four-year colleges in New York State to establish appropriate standards of performance.

The regents external degree is designed to open up higher education in New York and neighboring states, not by replacing the university as we now know it, but rather by extending it to include all sources of meaningful educational experiences. Having viewed the whole state as a source of instruction, we will seek ways of assessing what people learn from it.

The success of the Regents External Degree Program will not depend solely upon the development of appropriate testing instruments, however crucial this activity may be. With the help of others in the academic community, we are working on several related aspects which will also be essential if the program is to be successful. I am talking about such notions as "credit banks," "talent banks," information and guidance centers, and even a "consumers union of home study materials."

The idea of a credit bank (I dare say the others as well) is not new but the Regents of the University of the State of New York, serving as a regional examining agency, provide for its realization. An individual will be able to earn credit through the state's College Proficiency Examinations, the CLEP and Advanced Placement tests, and other examinations recognized by the external-degree faculty committees and then have this credit stored for future use. Students who take tests not administered by the university will simply have their scores forwarded to us for evaluation.

Other students might earn credit from panels of faculty and nonacademic experts in fields not covered by standard paper-and-pencil-type tests. One example might be the person who is accomplished in music or art; others may have worked extensively in urban planning, in state or local government, or in community activities without the prior approval of a college or university. Credit for such knowledge or competence would also be awarded by the regents.

Some people may elect to take regular courses at higher education institutions near their homes and have their grades reported to the regents. Should they find it necessary to move because of change of jobs or if they simply wish to interrupt their studies for whatever reason, their academic record would not be altered. Operating colleges may wish to take advantage of the regents program as a source of external examiners and examinations.

The regents will also explore ways of awarding credit for learning which results from educational programs offered by business, industry, and government, and by proprietary institutions.

Credit accumulated in the several ways just described would, of course, be counted toward a regents university degree. It would also be reported on a transcript of the University of the State of New York if a student wishes to apply it toward a degree at another institution. The regents as a degree-granting authority would thereby operate the university as a regional examining center where individuals and institutions could obtain academic services at a reasonable cost, while maintaining high standards. In each instance the regents are attempting to make entry, exit, and reentry easier for all who desire education beyond high school.

The regents do not plan to offer instruction leading to their external degrees. But they realize that many, if not most, of the students will need some formal instruction and guidance to achieve their goals. This is where the consumers union, talent bank, and guidance and information centers come in.

Since there are thousands of study guides, programmed texts, and correspondence course materials available commercially, students in external-degree programs will need assistance in making appropriate selections. We propose to have our faculty consultants evaluate some of these self-study materials, and report the results of this analysis to the public and to external-degree candidates. This service would constitute a a sort of consumers union for those requiring independent study materials as they prepare for an external degree.

The regents now need to tap all the educational resources of their campus—New York State. To the formally recognized educational establishment they are seeking to add the potential of radio and television, the church, research laboratories, performing art centers, proprietary business, trade and technical schools, historical societies, public libraries, and museums. They intend to make better and wider use of correspondence study and computer-assisted instruction; of industrial, commercial, governmental, and military training programs; and of the experience people gain through programs like VISTA and the Peace Corps and through travel, both at home and abroad. While most of us think of a college or university as a community resource—which it surely is—we must now expand our

thinking to view the community as an educational resource. The tremendous educational potential of New York State, viewed as the community of the University of the State of New York, will enable the Board of Regents to expand educational opportunity for anyone who is willing to make the necessary investment of time and effort.—DONALD J. NOLAN, *Director, External Degree Program, New York State Education Department.*

The British Open University

The Open University represents a major effort by the British government to provide a quality college education for an increased number of British citizens. In 1970 there were only about 50,000 spaces available for first-year students at all of the residential universities in Great Britain. The 25,000 additional spaces of the Open University, which opened its figurative doors in January 1971, therefore has provided a striking increase in the number of learning opportunities for first-year students. The 42,000 applications for the initial 25,000 student places give evidence of the interest of a large number of potential students who for a variety of reasons have previously missed the opportunity to continue their education.

The Open University requires that its students be more than 21 years old, but otherwise has no formal entry requirements based on previous academic qualifications like those demanded by conventional universities. In selecting from among the large number of applicants, preference is given to those who apply early and to those who display what might loosely be called "motivation." There is an effort to provide an enrollment balance among the occupations of the applicants and among the various programs of the university. Ten thousand spaces are reserved for the educationally underprivileged.

The educational program of this "correspondence" university is based upon a structured curriculum, televised courses, a one-week residential summer session, and a system of local study centers that provide tutoring and counseling. The students are expected to spend ten hours per week for 34 weeks to complete a series of correspondence lessons that are rebroadcast several times each week on television and radio. Students enrolled in the science courses receive, on loan, a package of experimental equipment with which to carry out practical work at home.

Six credits are needed to graduate (eight for an honors degree) and each year-long course is worth one credit. Apart from the need to include two multidisciplinary foundations course credits chosen from among the fields of art, science, social science, and mathematics, the student is free to make up his degree as he wishes. Three aspects of a student's work count toward his final rating: continuous assessment throughout the year, performance at the summer school, and the results of an end-of-session examination. For this examination external assessors are to be appointed to ensure that standards are in line with those of other universities.

Much of the philosophy underlying the design of the courses can be understood in terms of two basic ideas. The first is that the students are mature persons who left school several years ago having for some reason missed the opportunity of a higher education. Whatever the reason, students come from varying backgrounds and have different initial capabilities. The courses must therefore accommodate a wide spectrum of newly enrolled students and provide each with the opportunity to make the grade regardless of his initial performance.

Secondly, criticism of overspecialization practices in many universities has led to the development of programs that are much more broadly based. The foundations courses are all multidisciplinary. The one in science, for example, includes topics from physics, chemistry, earth science, biology, and the interaction between science and society. Even at the second level the courses are still mostly multidisciplinary and not until the third and fourth levels will there emerge the more conventional specialist type courses.

There are three facets to the organization of the university. Because many of the activities are regionally based, the country has been divided into twelve regions, each under the supervision of its own director who is responsible for setting up the study centers and for recruiting the counselors and tutors. The system will include several hundred local study centers. The central organization is located on a new campus 70 kilometers north of London. There curriculum materials and study packets are produced and student records are processed. The third aspect of the organization is located in London where the TV and radio programs are recorded. The Open University works in cooperation with the British Broadcasting Company but is an independent university rather than an offshoot from the educational broadcast component of BBC.

The advantages of teaching on a large scale are obvious. Substantial expertise is made available to a much wider audience and the costly development of expensive films and other aids becomes economically viable. Even on the basis of the most pessimistic forecasts of student dropout rates, the cost of educating a graduate is expected to be less than one half the equivalent cost at a conventional university.

The Open University is perhaps the first example of a degree-granting institution that incorporates teaching by television, correspondence study, programmed learning, and tutorial assistance in one massive operation. Although still in its formative stages, the imaginative flair that has gone into its planning and the rapidity with which the initial conception is materializing has already attracted world-wide attention. It could well set a pattern in higher education that will be adopted in many other countries in the years to come.—Adapted with permission from an article by F. R. STANNARD, *Faculty of Science, Open University.*

Minnesota Metropolitan State College

Nineteen seventy-one will not be recorded as a year singularly noted for increased appropriations for higher education. Yet for all the concerns for fiscal austerity, the Minnesota State Legislature authorized a new state college, Minnesota Metropolitan State College, whose purpose is to provide a new option in higher education. The college, designed to serve the seven-county metropolitan area including Minneapolis-St. Paul, admitted 50 students to a pilot program on February 1, 1972.

University Without Walls—staff member and student.

MMSC is not an entirely new educational model. To one degree or another, the elements of this program exist in other institutions. The uniqueness of the college is in the constellation of elements that have been integrated into the program of a single institution of higher education. What are the characteristics of this new college?

1. **Urban oriented.** The college is pro-city. MMSC accepts the city and seeks to produce graduates who can live, work, learn, and play in the city without being victimized by it. The city, for all its problems, represents a concentration of rich resources. Urban residents should not only be aware of and concerned about the critical issues confronting our cities but should also be actively engaged in finding solutions to urban problems. They must not simply be able to survive the city but to make the city work for them—to use the city's resources to enhance the quality of human life. Every program at this new college is city-oriented.

2. **The cities as campus.** Perhaps the most obvious distinction of the college lies in the fact that it claims the entire seven-county area as its campus. Its facilities will be those already existing in the cities. Learning will occur all over the metropolitan area, in factories, plants, libraries, churches, museums, community centers, parks, or on the streets. Rather than build new buildings and create an educational enclave relatively isolated from the total community, MMSC will conduct its programs at places and times convenient for its students.

3. **The new students.** Actually, the students at MMSC might better be characterized as the "old" students. The college will seek to serve those persons not ordinarily the target of higher education, those who are beyond 22 years of age, are employed full time and have at least two years of college, or its equivalent, and are resuming their education.

4. **The new faculty.** The college employs a core of full-time faculty, most of whom are professionally trained educators holding advanced degrees. In addition, MMSC will employ a larger number of part-time faculty who work full time at another profession or vocation in the community. They are drawn from business, industry, labor, and government and are selected because of their special skills and knowledge and because they represent models of fulfillment and accomplishment in society and the job market. They will include artists, housewives, retired persons, legislators, bankers, and social workers.

5. **Student-oriented.** At MMSC the individual student is the principal architect of his own education. The student, in consultation with an advisor and with assistance from an assessment and advising group composed of full- and part-time faculty and other students, goes through a process of self-assessment. He identifies his goals, needs, tastes, strengths, and weaknesses and then devises his own curriculum, which is outlined in an educational contract peculiar to his individual purposes and needs. The advisor for each student serves as a "broker" or facilitator, assisting the student in gaining access to those resources appropriate to his educational goals.

6. **Competence-based.** The most important characteristic of MMSC is its commitment to competence-based education. Graduates of the college will not have a typical transcript listing courses, credit hours, and grades. They will have a *narrative transcript* detailing their educational development and certifying a level of competence in each of five areas. Competence in these areas encompasses skills, knowledge, attitudes, and understanding. MMSC is not concerned with how, where, or when these competencies are acquired. It is concerned only that a person be able to demonstrate that he has acquired them. The five areas are:

Basic learning competence. A person holding a baccalaureate degree should demonstrate competence in methods of inquiry, communication, analysis, and evaluation. He should know the "how" of discovering and delivering: from reading to writing to mathematics to using the learning resources in his community.

Civic competence. An educated person knows how his society and its institutions function. He recognizes issues affecting him and his social-natural environment. Equally important to "knowing about," he participates in the civic-social processes of his environment. He not only is influenced by his environment, he influences it.

Cultural-recreational competence. The urban man must be knowledgeable about his cultural heritage and the rich variety of cultural resources available to him. He must demonstrate the skills and understanding necessary to use these resources. It is increasingly

important that modern man develop life-long leisure skills that enable him to re-create both himself and his environment.

Human growth and development competence. This area in some ways represents a gestalt of the other four. Man, in a complex social matrix, must be able to establish his own identity—to assess himself, to establish goals, and to devise strategies for realization of goals. He must appreciate differences, diversity, and complexity among people and among social structures.

Professional vocational competence. A baccalaureate degree program should lead to the acquisition of skills, knowledge, and understanding appropriate to the goals established by the individual. For some the degree may be preparation for further study in a graduate or professional school. For many, however, it is the terminal degree and should provide the individual with marketable skills. An educated person should possess both specific and general skills, knowledge, and understanding. He must be able to accommodate to the dynamics of a rapidly changing job market in a rapidly changing society.

The college is a new resource in this metropolitan community. It has no semesters or quarters, nor does it observe a five-day week. It operates around the clock and calendar. People should be able to stop and start an education at will. The independent variable is this will.

MMSC is an experiment. It is not a panacea, but indeed, it is an option within American higher education.—DOUGLAS R. MOORE, *Vice President, Minnesota Metropolitan State College.*

The University Without Walls

A number of pressures have been building up in recent years forcing institutions of higher education to re-examine many of their long-held beliefs about the form and nature of undergraduate education:

- New kinds of students are seeking a college degree. Many of them are older and more experienced than the typical college student. Many more come from minority groups and financially disadvantaged homes. These new students bring with them new kinds of aspirations and handicaps which require flexible and individualized programs.
- New viewpoints and ideas are emerging about what is important in the sciences, humanities, and social sciences. Faculty and students alike have become aware that much of what is taught is unusable or obsolete, and that much of what needs to be learned is not or cannot be found within the confines of the traditional college. New careers have arisen requiring special competencies which few institutions are able to provide no matter how comprehensive their course offerings.
- Rapid advances in science and technology have added greatly to the explosion of knowledge and pose both problems and challenges as to how man can master the technology to its fullest potential without being mastered by it.
- The financial plight of colleges and universities has grown increasingly serious requiring them to find ways to operate under far more stringent conditions than has ever been necessary before, and yet to do so without sacrificing the quality of their educational programs.

The University Without Walls program developed in response to these pressures and is an alternate form of higher education. It seeks to build highly individualized and flexible programs of learning and makes use of new and largely untapped resources for teaching and learning. It moves toward a new faith in the student and his capacity for learning on his own, while at the same time providing close and continuing contact between the student and teacher. It redefines the role of the teacher as a facilitator and co-participant in the planning and design of the student's learning experience, and it seeks, through its inclusion of students from a broad age range (16 to 60 and older), to build a new dialogue and trust between younger and older persons.

Some 3000 students are now enrolled in University Without Walls programs under the auspices of 20 colleges and universities (Antioch, Bard, Friends World, Goddard, Loretto Heights, Morgan State, Roger Williams, Skidmore, Staten Island Community, Stephens, and Westminster colleges; New College at Sarasota; the universities of Massachusetts, Minnesota, and South

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From left to right: staff member, student.

Carolina; and Chicago State, Howard, Northeastern Illinois, New York, and Shaw universities). Students range in age from 16 to 71, and they come from diverse backgrounds. A large number of students come from minority or highly disadvantaged groups.

The structure of each UWW unit has been designed by a team of local administrators, faculty and students. These structures are still evolving as experience accumulates, but the principles of autonomous development and genuine student involvement and responsibility are given continuing prominence.

Each student follows a tailor-made program worked out with his advisor. There is no prescribed curriculum and students study in variable time frames or episodes. They are encouraged to make use of a broad variety of learning experiences in the pursuit of their objectives, from regular course work as desired or needed, programmed materials, cassettes and other technologically aided forms of instruction, to internships, apprenticeships, field experiences, independent study, individual and group projects, and travel in this country and abroad. A wide-ranging Inventory of Learning Resources takes the place of the traditional college catalog. There is no uniform time schedule for the award of the degree, and graduation will take place when the student has achieved the learning objectives agreed upon with his advisors, be it one, four, or twenty years after he began.

Most students work with one or more adjunct professors—men and women employed in business, social service, scientific research, government, the arts, and other professions—who give part of their time to help undergraduates learn. On a continuing basis, the competence of a student is jointly assessed by the student, his advisors, his supervisors, and adjunct professors. In addition, each student keeps a cumulative log which lays out his educational targets, the methods he uses in trying to achieve them, and his own evaluation of his progress as well as the evaluations made by others with whom he has been working.

It is difficult to generalize about the students who are presently enrolled in the University Without Walls. They are deeply motivated individuals who are particularly concerned with social problems in the cities and society in general, with education, and with the arts. The range of their interests covers every acknowledged discipline, and then some. A number of exciting developments have occurred as the program has caught the attention of other organizations. Such "spin-offs" include the creation of special UWW programs in conjunction with rehabilitation centers for drug addicts and alcoholics, programs to aid para-professionals in medical and other professions as they seek advancement, and programs to serve convicts in penal institutions.

As programs were just getting under way last fall, we asked our project directors to comment candidly on whether they had found the UWW procedure for creating individualized programs applicable for all fields, including especially the sciences. The answers were consistent: "We have been able to create individualized programs for all of our students," wrote one. "In my view, the procedures have value across the board," wrote another. "The UWW framework appears useful and appropriate for virtually any specialized field. The limitations are largely those of figuring out ways for persons to have new forms of learning experiences within existing settings." (Experience this year has shown that they are not limitations as much as exciting and rewarding challenges.)

Many people are still asking questions about what a college should be, whom it should serve, and what should be taught and how it might best be learned. With the University Without Walls, we feel we are providing a means for each individual to find his own answers. But those answers, we think, may just change the whole form of higher education in the years to come.—SAMUEL BASKIN, *President*, and RICHARD NEWBERGER, *Associate Program Director for Communication Systems, Union for Experimenting Colleges and Universities, Antioch College, Yellow Springs, Ohio.*

American Association for the Advancement of Science

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Editor's Note:

Thirteen science teaching societies were reported in the December (1971) issue of *Science Education News*. We are happy to distribute, loose-leaf in this issue, reports of two other organizations. We regret that not all reports could be included in the December issue.—J.R.M.

National Council for Geographic Education

The National Council for Geographic Education was organized in 1914 to promote and increase the effectiveness of geographic education. The goals of the organization, are to:

(1) encourage the training of teachers in geographic concepts, practices, teaching methods, and techniques;
(2) provide leadership in forming geographic education policies;
(3) develop effective geographic education programs in schools and colleges and with adult groups;
(4) stimulate the production and use of accurate and understandable geographic teaching aids and materials;
(5) work with other groups and organizations interested in advancing the understanding of man in his environmental setting through the study of geography, history, environmental sciences, and social sciences; and
(6) impress upon the general public the immediate need for better geographic education and an objective awareness of man in relation to the natural environment as a part of a general desire to improve our existence in the world on both a domestic and international basis.

To achieve its purposes, the membership of the NCGE has assigned the following service functions to the officers, executive board, and committees of the organization.

Expedite communications. The primary communications channels of the NCGE, serving a membership of approximately 7,000 are the *Journal of Geography* and *Perspective*, the organization's newsletter. These publications provide approximately 600 pages of information a year. In addition, NCGE yearbooks are major sources of data and ideas for the teaching of geographic material at all instructional levels. The NCGE maintains a publications center that produces books, monographs, and professional papers which are a valuable source of relatively low-cost materials. The annual conventions of the council are an important means of communication and interaction among the interested public, business and industry, and educators.

Set and maintain professional standards. The NCGE sets and maintains professional standards in at least three ways: (1) by endorsing various privately produced materials, but only after their authenticity and worth have been proved by a qualified review board; (2) by editing NCGE publications to ensure the finest quality materials possible; and (3) by sponsoring award programs which recognize distinguished service, outstanding contributions in writing, and excellence in the teaching of geography.

Coordinate and sponsor productive activities. The NCGE also coordinates and sponsors a host of productive educational activities. The organization is moving, through a number of task forces, toward coordination of research on geographic learning, the development of geographic curricula, implementation of geographic education through educational television, the development of guidelines in teacher education and the evaluation of performance in geographic instruction, and toward a coordination of the principles of geographic education and environmental education. The Council has sponsored, for the fourth consecutive year, a convention-connected national institute for teachers and teacher trainers. The council's Grants and Research Committee is continuously searching for worthwhile ventures in which NCGE activity and sponsorship will contribute to the improvement of geographic education.

Provide official spokesmanship. Providing official spokesmanship for geographic education is a major function of the NCGE. The organization keeps regular contact with governmental agencies and other professional organizations. A principal aim of the council is to broaden dialogue with all related fields, both discipline-oriented and education-oriented, in the best interests of geographic education and its membership, as well as the entire teaching community.

Membership in the NCGE is available in a number of categories to anyone interested in the improvement of geographic education, on payment of the annual dues. Membership categories include (a) regular, (b) institutional, (c) contributing, (d) corporate, (e) life, and (f) student. A reflection of its broad interests, NCGE membership includes teachers at elementary, junior high and senior high school levels, junior colleges, state colleges, universities, and representatives from government, business, and industry.—WILLIAM W. ELAM, *Executive Secretary, NCGE, Rm. 1226, 111 West Washington Street, Chicago, Illinois 60602.*

Associated Organizations for Teacher Education

The Associated Organizations for Teacher Education (AOTE) is composed currently of 17 organizations which have strong interest in the preparation of teachers. The primary purpose of the AOTE is to share ideas and information and to coordinate appropriate efforts in teacher education among its constituent members.

One of the thrusts of the AOTE has been in the area of accreditation, particularly with regard to the role of the professional and learned societies in the process. Some of the activities of the AOTE in this area include (1) a conference of 35 interested organizations, (2) a publication, "Developing Guidelines in Teacher Education," (3) the establishment of a Clearinghouse on Currently Available Guidelines (such as *Preservice Science Education of Elementary School Teachers* by the AAAS), and (4) the compilation of a Manual of Short Forms of Currently Available Guidelines

which has been supplied to institutions coming up for NCATE accreditation during the 1972-73 academic year.

Another current interest of the AOTE is an invitational National Working Conference on Teacher Education tentatively planned for the spring of 1973. This conference carries the theme "Revolution in Teacher Education by '76." At that time the leadership of those organizations in AOTE and other appropriate organizations and agencies will be invited to come together to work on some of the chief issues confronting teacher education. As concerted efforts toward the solution of one or more of these issues can be secured from the participating organizations, a major impact on teacher education can result.

The AOTE is also currently interested in an inservice teacher education project with an international dimension, which will include several of the constituent member organizations. Other areas of recent concern, for which a publication is now, or soon to be, available are (1) the cooperation of industry and education in the area of educational technology, and (2) the preparation of educational personnel for the inner city.

The AOTE jointly sponsors a general session at the annual meeting of the American Association of Colleges for Teacher Education each year, which is used either to launch or to culminate an area of interest of AOTE.

The current chairman of AOTE is Dr. William H. Evans, professor of English and secondary education, Southern Illinois University, a representative of the National Council of Teachers of English. The chairman-elect is Dr. Sam Wiggins, dean, College of Education, Cleveland State University, a representative of the American Association of Colleges for Teacher Education. The Advisory Council guides the work of the AOTE. The secretary of AOTE is Mark Smith. Further information may be secured through him at One Dupont Circle, Washington, D.C. 20036.—MARK SMITH, *Secretary, AOTE.*

Recent Publications

The bibliography below was prepared by DONALD J. DESSART, University of Tennessee, Knoxville.

Developmental Programs in Midwestern Community Colleges, by Richard I. Ferrin (Midwestern Regional Office, College Entrance Examination Board, 990 Grove Street, Evanston, Illinois 60201, 1971, 50 p.).
The report of a survey designed to determine the nature and extent of special educational and support services for educationally disadvantaged community college students and based upon responses from 76 percent of the 180 public two-year colleges in the Midwest. Nearly 35,000 students (about one student in nine) were enrolled in remedial courses, academic skill services, or formal developmental programs during the fall of 1969. Approximately 60 percent of these students later entered bachelor's degree study, started vocational programs, or remained in the developmental classes for further work. Of those who left college, about one-third had definite job plans. Overall, positive outcomes were reported for 75 percent of all the students in the programs!

Role Playing and Teacher Education: A Manual for Developing Innovative Teachers, by David L. Lehman (The Commission on Undergraduate Education in the Biological Sciences, 3900 Wisconsin Avenue, N.W., Washington, D.C. 20016, 1971, 59 p., free).
Attempting to create situations for neophyte teachers to gain experiences in dealing with some of the "real-life" problems arising in a science classroom is a difficult task. This manual describes teaching situations which may be simulated by role-playing techniques in which students act designated roles; such as, the teacher, the bored student, the bright student, the science supervisor, etc. Each of the situations is described by defining the roles of each of the participants. Some of the situation titles are: "The Why Lab," "The Confused Lab," "What's on the Test?" "The Gigglers," "Testing Out the Teacher," "Bored," "We Disagree," and "A New Position."

The Systematic Biology Collections of the United States: An Essential Resource (Conference of Directors of Systematic Collections, The New York Botanical Garden, Bronx, New York 10458, 1971, 33 p.).
Systematic biological collections are essential for training new biologists and for research studies on water pollution, diseases, poisonous snake detection, drug exploration, and other topics. In spite of their usefulness, the museums, botanical gardens, and herbaria housing these collections have not received the kind of financial aid provided other institutions in the United States. Without immediate aid, the inevitable end-product will be serious deterioration of specimens with irreparable damage that will eventually harm all Americans, if the ecological wars are lost because of the lack of availability of systematic collections for research.

Aids to Education in Science, by M. S. Kuhring (Overseas Book Centre, 75 Sparks Street, Ottawa 4, Canada, 1971, 64 p.). Descriptions of equipment designed to illustrate various physical laws and phenomena. Among the designs are included pieces of apparatus for demonstrating surface tension, angle of incidence and reflection, thermal expansion, centripetal force, viscosity, gravity, and the development of colonies. The discussions of the designs are very good but lack specific identifications of generalizations or learning objectives to be achieved by students exposed to the demonstrations.

Computer-Assisted Instruction at Stanford, by Patrick Suppes (Institute for Mathematical Studies in the Social Sciences, Stanford University, Stanford California, 1971, 41 p.). Reviews the history of Computer-Assisted Instruction (CAI) at Stanford from its beginning in January, 1963, when the Institute for Mathematical Studies in the Social Sciences began a research program in this area through a recent project in which a communication satellite was utilized to distribute CAI considerable distances. Predictions for the future range from further research during the '70s on dialogue systems and models for students to the daily use of computers by 15 percent of students at all grade levels in the United States by 1980.

The Decision-Making Process in the Adoption of a New Physics Course in American High Schools, by John F. Yegge, Fletcher G. Watson, and Stephen S. Winter (Harvard Graduate School of Education, 13 Appian Way, Cambridge, Massachusetts 02138, 1971, 189 p.).
Report on a survey of more than 450 teachers attending 14 summer institutes during the summer of 1970 and nearly 100 of their local school administrators conducted by holding on-site discussions, which were later compared with the results of questionnaires completed by the participants of the survey. Findings of the study indicated, as one might expect, that teachers were the most important persons in the adoption process, but, surprisingly, these teachers were not aware of the importance of their roles. Characteristics of the teachers indicated, in general, keen professional interests by those who promote changes.